



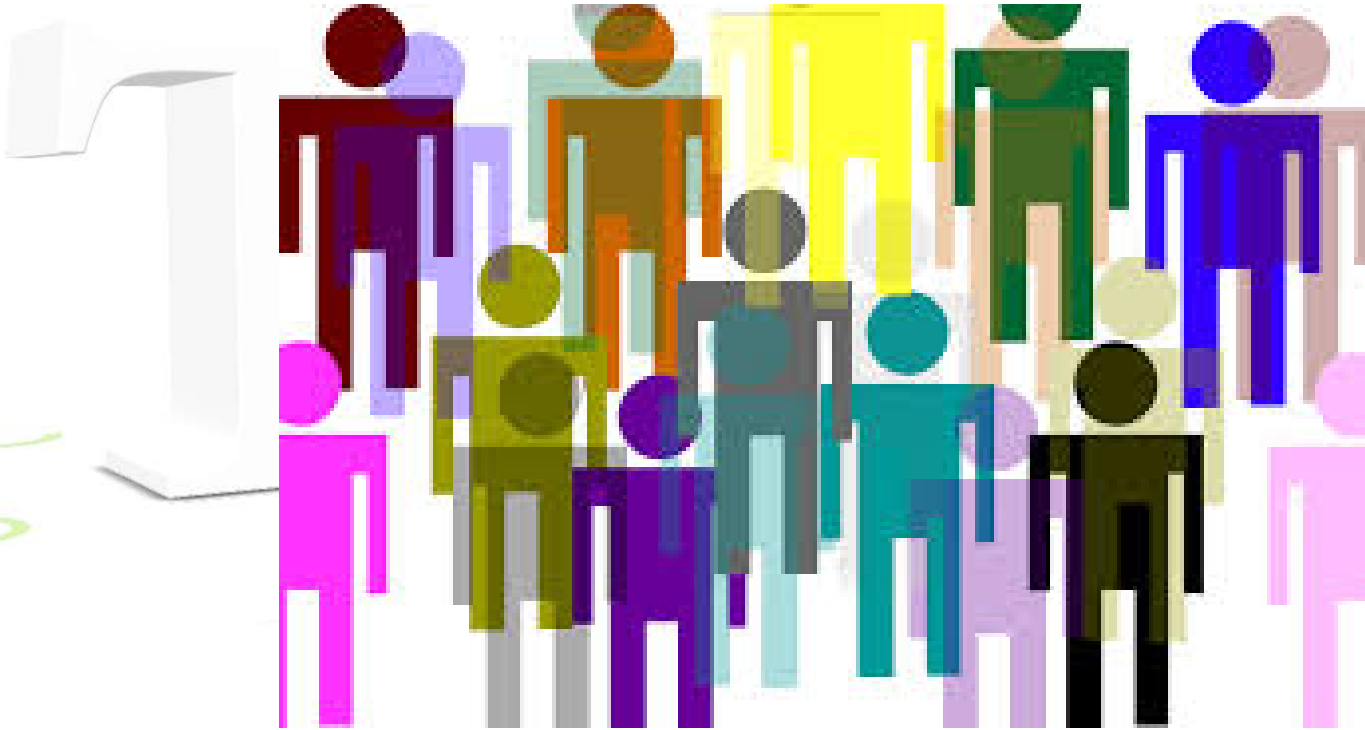
# Adult learners and Mathematics Support: Getting to the Root of the Problem

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# The Higher Education – A Changing Landscape



# Distribution of all Full-time Undergraduate new Entrants for all HEA Funded Institutions 2011/12 Vs 2010/11

	M	F	Age as % of Total	2011/12 Total	2010/11 Total
17 and under	1,086	1,113	5.4%	2,199	2,416
18	6,730	7,226	34.2%	13,956	13,846
19	6,531	6,709	32.4%	13,240	12,483
20	1,664	1,739	8.3%	3,403	3,285
21	692	606	3.2%	1,298	1,344
22	362	321	1.7%	683	727
23	261	200	1.1%	461	491
24	445	373	2.0%	818	906
25-29	1,176	858	5.0%	2,034	2,237
30 and over	1,574	1,197	6.8%	2,771	3,013
Age Unknown	2		0.0%	2	1
<b>Total</b>	<b>20,523</b>	<b>20,342</b>	<b>0.3%</b>	<b>40,865</b>	<b>40,749</b>

~15%

[www.hea.ie](http://www.hea.ie)



# Profile of our Future Students

The demand from students entering higher education directly from second-level, however, will increase only marginally, while the bulk of the increased demand will come from late entrants, mature students and international students and greater demand for postgraduate study. **Of these categories, the largest proportionate increase will be among mature students.**



# Projections for the Future

	2009		2015		2025		2030	
	Number	% of total	Number	% of total	Number	% of total	Number	% of total
Direct	29,982	70	30,621	61.8	34,277	52.8	33,558	52.3
Late	3,855	9	4,459	9	5,843	9	5,775	9
Mature	5,568	13	8,919	18	16,229	25	16,041	25
International	3,426	8	5,500	14.2	8,569	13.2	8,790	13.7
Total	42,831	100	49,549	100	64,918	100	64,164	100

National Strategy for Higher Education to 2030

A Technological University must have a combined minimum of 30% of ..‘lifelong learning’ students enrolled on professional focused courses and industry up-skilling, including part-time, work-related courses, work-study courses and/or mature learners (HEA, 2012c).



# Part-time and flexible higher education in Ireland

## Policy, practice and recommendations for the future

- 92% of those entering part-time, undergraduate courses are mature students (age 23 or older), compared to 15% of full-time entrants.
- Similarly, 92% of entrants to Springboard courses in 2011-2012 were mature students.

# Over Arching Recommendation:

‘By 2016, full equality of provision and support will have been achieved in higher education for all students, regardless of time, place or pace of study’.



# Meet a Mature Student



# What the Research says...

- Research on adult students learning mathematics has given an ambiguous portrait of how adult students compare to traditional-age student

# Characteristics of Adult Learners

Rodgers, identified seven characteristics that seem to be true for the majority of adult learners as follows:

- *The student participants are adult by definition*
- *They are in a continuing process of growth, not at the start of a process*
- *They bring with them a package of experience and values*
- *They come to education with intentions*
- *They bring expectations about the learning process*
- *They have competing interests*
- *They already have their own set of patterns of learning (1996, p. 60)*



# Adult Attitudes and Beliefs about Mathematics

- Adults tend to identify mathematics with arithmetic.
- Adults claim to be convinced of the importance of mathematics in our society.
- Many believe that there is an inherent natural ability for mathematics.
- The more school is the reference point the more the usefulness and the aim and object of mathematics are questioned.
- Adults relationship to maths in school particularly beyond elementary school has often been emotionally strained even that anxiety has become the dominant feeling.

(FitzSimons et al, 1996, p. 768)



# Motivated but lacking Confidence

Although adult learners tend to be highly motivated to learn they often lack self-confidence in their ability to do so, and require continuing encouragement.

Nordstrom, (1989).



# Life Experience has a major Influence

- All adults use diverse mathematics in various different contexts in their lives, each adult forms individual opinions on mathematics according to their own experiences and devise techniques to solve their own everyday mathematics problems.

(Newman, 2000)





**‘The path of least resistance and least trouble is a mental rut already made. It requires troublesome work to undertake the alteration of old beliefs.’**

John Dewey, *How We Think* (1933)



# Socio-Economic Status of Mature Entrants

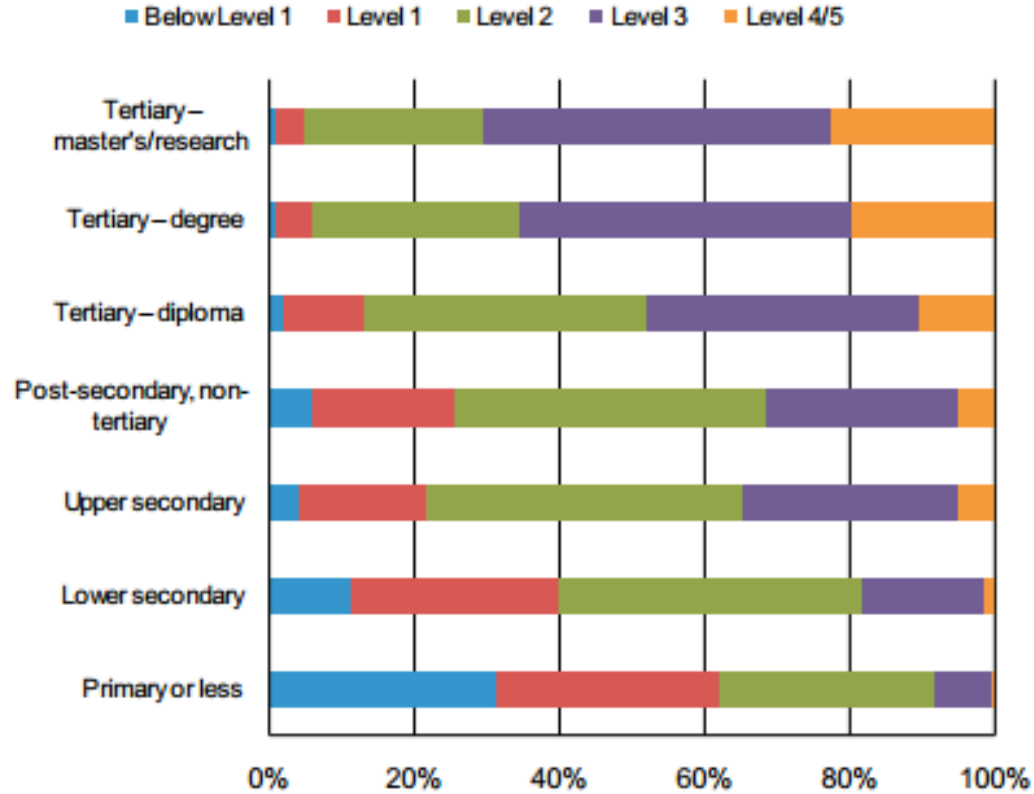
The largest proportion of mature new entrant respondents come from a Manual Skilled background, this contrasts with the non-mature respondents whose largest socio-economic group is Employers and Managers





## Percentage of adults at levels of numeracy proficiency by highest level of education achieved

PIAAC 2013



Look at the graph about the number of births. Click to answer the question below.

During which period(s) was there a decline in the number of births? Click all that apply.

- 1957 - 1967
- 1967 - 1977
- 1977 - 1987
- 1987 - 1997
- 1997 - 2007



The following graph shows the number of births in the United States from 1957 to 2007. Data are presented every 10 years.



Level 3 item

Correct Response: 1957 - 1967 AND 1967 - 1977

Look at the thermometer. Using the number keys, type your answer to the question below.

What is the temperature shown on the thermometer in degrees Fahrenheit (°F)?

 °F

Level 3 item

**Correct Response:** Any value between 77.7 and 78.3



# Invisible Mathematics

In the workplace and in everyday life, adults are using complicated mathematical ideas and techniques, but are seemingly unaware of their significance in mathematical terms.





# Context is Important

Nurses and pilots use contextual anchors when solving problems.

Hoyles and Noss, (1998) Coben & Hutton (2011)



Where mathematics is situated in professional/vocational practice it should be taught, learned and assessed in relation to that practice, .....the latter enables individuals to be exposed to the full range of problems associated with the use of mathematics in their professional practice, something which may be impossible to do safely, comprehensively and effectively in real world, real time contexts.

(Coben & Hutton, 2011)



In response to growing concern, since September 2008 nursing students in the UK must achieve 100% in a test of numerical competence in the practice setting before being allowed to register as nurses (NMC, 2007)

# Other Characteristics

- Huge range of mathematics histories
- Often poor preparation for Third Level
- Other commitments and responsibilities
- Some adult hold the belief that they are incapable of ever understanding mathematics
- Forgotten skills/Badly remembered basic skills



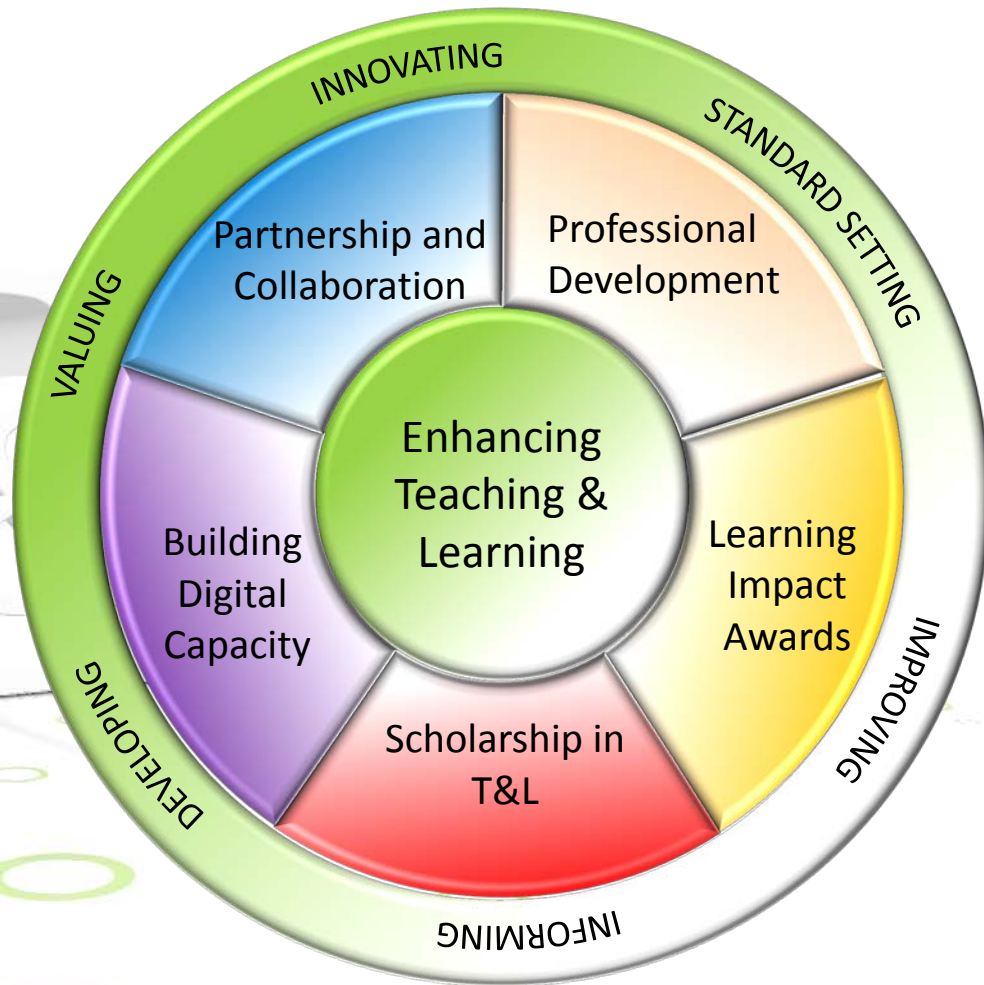


# What are the implications for MLCs?

- Need to ensure preparation programmes (different levels?) can be accessed by all mature students
- All mature students should be strongly encouraged to participate
- Don't focus on the problem - focus on the person- but beware of developing 'needy' students
- Maths support should be contextualised to the student's discipline to help them make meaning
- Maths support provision needs to be strategically developed to ensure the appropriate level of support is available for our growing cohort of mature students in the future



# How can the Forum support the Maths Learning Support Network?



# ALM 21 Bern, Switzerland June 29<sup>th</sup>- July 3<sup>rd</sup>

- Adults Learning Mathematics Inside and Outside the Classroom'

Please Visit

[www.alm-online.net/](http://www.alm-online.net/)



# Thank You

- I am looking forward to discussing some of the issues I have raised with you later in the afternoon

